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THE BULLETIN

Vol. VI.

No. 6

Hydro-Electric Power
Commission of Ontario

DECEMBER

1919



Cameron Falls, Nipigon River, looking north from temporary bridge

THE BULLETIN

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**Hydro-Electric Power
Commission of Ontario**

**ADMINISTRATION BUILDING
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TORONTO**



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Editorial

Merry Christmas Everybody and a Glad and Prosperous New Year

The Bulletin takes this present opportunity of wishing all of its readers a genuinely happy Christmas.

For the year that is just closing, our expectations have, on the whole, been well fulfilled. We look towards the coming year with every confidence that it will be even more productive, and will witness still greater achievements in our joint enterprise.

Great as it is today, Hydro is but just safely past its infancy. We grow by leaps and bounds almost as the second hand on your watch ticks away. There is no slackening up---the movement gains added impetus hourly.

It is a cause for deep satisfaction and pride to anyone connected with Hydro to reflect upon the great work which it has done.

There is more to life than the gaining of a few dollars to supply one's needs. Today, men do not work simply to keep their stomachs full and to secure the bare necessities of life. This unthinking existence belongs to another age, and to all thinking men there is a profound pleasure in work well done, and who would not rather work for a vast public-spirited enterprise like Hydro and feel that they were doing their little bit toward the great work. It is pleasant to think that one is even a small and relatively unimportant cog in the great mechanism. Small as we all are independently, our united effort and the loyal support of citizens throughout the province has helped to build Hydro to its present proportions and will help toward our ultimate goal. No one can be connected with Hydro long without a realization of the Hydro ideal, and most of us find that working for Hydro is much more pleasant than simply holding down a job. Everyone feels the spirit of the movement.



Technical Section

A Test of Motion Picture Projection With Mazda Lamps

By Geo. G. Cousins

Hydro-Electric Power Commission Laboratories

SINCE the recent publication in the BULLETIN of an article on "Mazda Lamps for Motion Picture Projection," a test and demonstration of this type of lamp for the above mentioned purpose was made at the laboratory. The results are presented in what follows, in the hope that they will add to the value of the previous article by furnishing definite data from which a more intelligent understanding of the problem may be obtained.

The equipment with which the test was made consisted of the following:

Projector: Lockord animatiscopes.
Lamp house: Argus adapter.
Regulator: 25-cycle, hand operated.
Lamp: Mazda 600 watt, 20 ampere.
Condenser lens: Single, prismatic.
Reflector: Concave spherical mirror.
Objective lens: Standard type 1½" diameter.

Screens: Plain cotton and aluminized window shade.

The projector was set up with its objective lens 50 feet from the screen.

At this distance the maximum dimension of the picture space was 11.4 feet, which is a very suitable size for auditoriums of moderate size.

It is important in setting up and adjusting the various optical parts of the equipment to adhere to the conditions that experience has proved to give the best results. However, these adjustments are not difficult, and by following the regular instructions accompanying each outfit standard conditions are easily obtained. First, the objective lens, gate aperture, and condenser lens are adjusted to a common axis by means of an aligning rod, and the lamp is adjusted so that its filament center is in line with the center of the condenser. The reflector is thrown out of position, and by means of the objective lens an image of the lighted lamp filament is produced on one of the shutter blades, which is placed stationary in the beam. It is necessary to prop open the fire door while this is being done. The reflector is now moved about until a sharp reflected image of the filament is produced so as to fill up the spaces between the filament coils of

the primary image. When this is accomplished the reflector is clamped rigidly and no further adjustments are necessary. If the shutter blade be now rotated out of the beam an even illumination of the screen is seen. Contrary to the fear of many operators experienced with the older type of optical equipment, no trace of circular images of the prismatic rings of the condenser lens is visible. A sharp image of the condenser lens is produced a few inches in front of the objective lens, but this is completely diffused before the screen is reached.

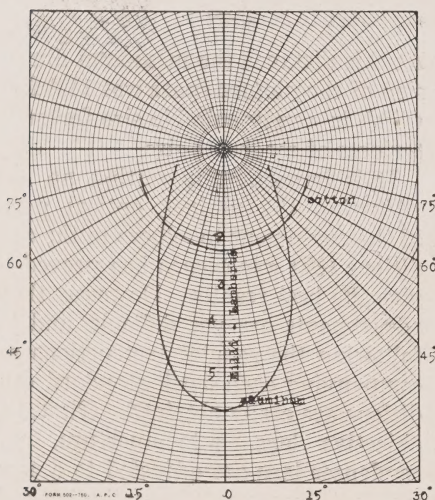


Figure 1

HYDRO-ELECTRIC POWER
COMMISSION OF ONT-
ARIO PHOTOMETRIC
LABORATORY

Curves showing the distribution of surface brightness of plain cotton and aluminized motion projection screens perpendicular to center of screen.

Projector: Lockord animatiscopes with Argus mazda lamp adapter.

Lamp: 600 watt 30 volt Mazda projection.

Condenser lens prismatic 3 inches diameter.

Reflector: Bausch & Lomb spherical mirror.

Objective lens: 1-1-2 inches diameter.

Length of picture space: 11.4 feet.

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Tested by.....

Approved by.....

Measurements of screen illumination were made across the picture space at the screen, the results of which are plotted in Fig. 1. These measurements were made with the photometer test plate facing the beam of light, the test plate in this position being about four inches in front of the screen. It will be seen from the curve that there is a slight falling off of intensity toward the edges, but this is not detected by the eye, and the illumination is quite satisfactory as regards uniformity.

Illumination is cause, and brightness is its effect, and it is brightness that an observer sees and passes judgment upon when viewing a picture. A given illumination may produce a very wide range of brightnesses when it falls upon different surfaces, and it becomes important, because of this, to furnish a suitable screen of as high reflecting power as is possible to use (consistent with local conditions) in

order to make the best use of the available illumination. Plain white cotton and white plastered walls are the oldest forms of projection screens. Metallized and mirrorized are the newest types of screens.

A reel of film was run through the machine with its pictures thrown upon a plain white cotton screen. The results were pronounced quite satisfactory by those who witnessed this trial.

An aluminum-coated screen of window shade material was then suspended over the front of the cotton one, and the pictures again projected. The aluminized screen was of smaller dimensions than the cotton one, and was too small to include the whole of the picture space. This condition afforded an excellent opportunity to make visual comparisons of the two screens. From positions near the axis

of the beam the aluminized screen appeared much brighter than the cotton. This higher brightness decreased as the screen was viewed from positions towards the side until a position was found where the two screens were of equal brightness. Beyond this toward the edge of the screen the cotton appeared brighter.

To measure the distribution of brightness of the two screens a semi-circle was drawn on the floor with a point under the center line of the screen as the center of the arc. Positions 10° apart were marked on this arc, and a measurement of the screen brightness was made from each position with the photometer pointing toward the center of the screen. Fig. 2 shows the plotted results of these measurements. The brightness is expressed as milli-lamberts, which is the common unit of brightness.

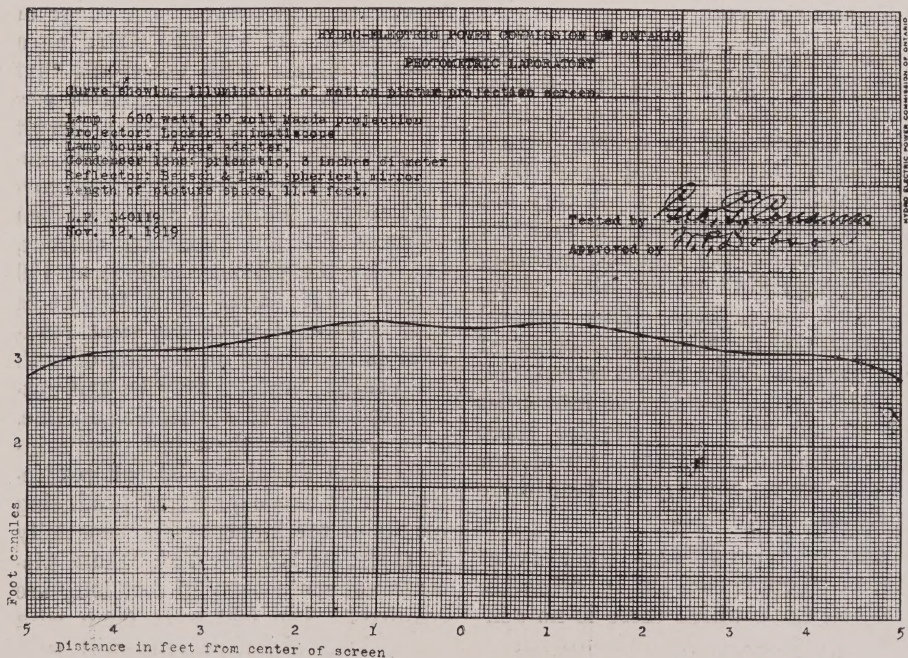


Figure 2

The suitability of either type of screen depends upon the relative depth and width of the auditorium in which it would be used. Most picture theaters are long and narrow and well adapted to the use of metallized screens. Where a considerable portion of the audience would be seated near the edge (beyond 40° from the center of the screens discussed here) the cotton screen would be to their advantage.

The maker of the aluminized screen used in this test applied aluminum paint to the surface with an air brush for the particular purpose of producing high reflectivity with considerable diffusion. By applying the aluminum paint with an ordinary brush made of bristles a higher gloss is obtained which produces a curve longer and narrower than the one shown here. It is, therefore, not safe to consider this curve as typical of aluminized screens in general.

In applying these data to practice the general illumination of a theater must be considered. Enough light must be provided to enable patrons to follow the aisles and reach their seats without stumbling. A very low intensity of illumination is sufficient to do this, but the required intensity varies according to the ideas of individual managers. This general illumination decreases the contrast of the pictures shown on the screen, and in consequence the higher intensities of illumination will require more screen illumination from the projector to produce satisfactory contrast in the pictures.

The most satisfactory intensity of screen illumination is a debatable subject, upon which there is no general agreement. Several authorities, however, state opinions that about 5-

foot candles produces the most comfortable conditions. Judged by this the results obtained in the laboratory might be rated as fairly good. By the simple substitution of a $2\frac{1}{2}$ -inch diameter objective lens for the $1\frac{1}{2}$ -inch lens used in the test at least twice as much illumination would be produced on the screen, which would raise the rating to the real good (approximately $6\frac{1}{2}$ -foot candles average). By using a 900 watt lamp with a $2\frac{1}{2}$ -inch lens the screen illumination would be about 10.6-foot candles, due to 50% increased wattage (over the 600 watt size), and 13% increased lumens per watt. This should be sufficient to satisfy the most exacting demand, except in the very large theaters, where a much larger picture is required.

The current regulator used in this test was rated for use on 25 cycles, and when used on a circuit of this frequency gave a very large range of adjustment. It was also tested on a 60-cycle circuit, with the result that a more limited range of control was available. With the primary circuit at 108 volts the line variations occasionally caused the secondary current to fall below 20 amperes when adjusted for the maximum current, but with the primary voltage at 110 this did not occur. This feature is only important when the same regulator is to be used on circuits of both frequencies, such as may be encountered in the use of a portable machine.

In conclusion, these test results indicate that the Mazda 30 volt projection lamps are capable of producing results of the highest class, especially in moderate size theaters, where pictures not more than 15 feet long are required. The 600 watt lamp with a $1\frac{1}{2}$ -inch objective lens will give quite satisfactory results in halls and

auditoriums of the smaller size, where a 10-foot picture is satisfactory. For the ordinary theater the 900 watt lamp with 2½-inch objective lens and aluminized screen is recommended.

Pictures projected with the Mazda lamps are of excellent color quality and absolutely free from stroboscopic pulsation, such as is seen with alternating current arc lamp projection.

Widening the Radius for Electric Power

RECENT achievements are increasing the distances of economical transmission of electric energy. In long distance transmission of electricity, high pressures or voltages are required—the higher the voltage, the lower the losses. For several years after long-distance transmission had been introduced, it was the practice to allow a pressure of approximately 1,000 volts per mile. It was found, however, particularly with distances of over 100 miles, that the distance allowed could be increased to as much as two miles per 1,000 volts. In other words, lines operating at about 100,000 volts pressure have been transmitting energy over distances exceeding 200 miles. More recently, lines operating at 150,000 volts have demonstrated their practicability; one of these has been in successful operation for over five years.

Now, electrical engineers are of the opinion that pressures of 220,000 volts are quite feasible, and it is stated that “the handling of electrical potentials of 220,000 volts does not appear to involve any disturbing complications or uncertainties. In fact, the manufacturers do not recognize that any serious problem exists. Current design principles and materials now in ordinary use will be employed, the principle difference from present high

voltage equipment being the greater amounts of insulation and the larger clearances required. The step to 220,000 is relatively no greater than that previously taken from 66,000 volts to 110,000 volts, or from 110,000 volts to 150,000 volts. Certain of the manufacturers have already developed designs, and assert readiness to undertake the commercial production of 220,000 volt equipment on short notice.”

The advantages of long distance transmission are of particular interest to Canada, where much of our water-power is found in large units and, to reach many consumers, it may be necessary to transmit the energy for a considerable distance. It is perhaps of greatest interest in connection with our abundant water-powers in the River St. Lawrence and in the area lying to the north of the settled regions of the Prairie Provinces. It brings us closer to the possibility of making these vast stores of energy available within the settled portions.

In Saskatchewan, for instance, the power sites of the Churchill River are only some 250 miles from Saskatoon and 350 miles from Regina. The transmission of energy over these distances would be quite feasible at 220,000 volts, and economically possible when the demand of the entire district reaches a high enough figure.—*Conservation.*



Showing the Illumination Effect of Horseshoe Falls—Arranged by the Hydro-Electric Power Commission of Ontario.

Arrangement of the Projectors for the Flood Lighting of Horseshoe Falls



Arrangement of Units on The Ontario Power Company's Roof



Arrangement on Table Rock House

Association of Municipal Electrical Utilities



MINUTES of Executive Committee meeting, November 12, 1919.

The meeting was called to order at 2 o'clock p.m., at the office of the Hydro-Electric Power Commission of Ontario, Toronto.

Those present were: Messrs. O. H. Scott, President; E. V. Buchanan, M. J. McHenry, H. F. Shearer, R. H. Martindale, W. E. Reesor, H. H. Couzens, R. C. McCollum and S. R. A. Clement, members of the Executive Committee, and L. G. Ireland and T. C. James, committee members.

A letter from Mr. S. L. B. Lines, President, The Chamberlain & Hookham Meter Co., Limited, was read. This letter suggested that a meeting of the Association, the Hydro-Electric Power Commission of Ontario and the manufacturers be called for the purpose of considering the standardization of the meter connections, covers and dials. Mr. Lines being present, advised as to the action that had been taken up to this time by the Meter Committee of the Hydro-Electric Power Commission of Ontario.

The Secretary was instructed to refer the letter to the Regulations and Standards Committee, and ask the Chairman of the Meter Committee of the Commission to advise the Chairman of the Regulations and Standards Committee of the next meeting and request him to be present.

Letters from Mr. R. J. Durley, Secretary, Canadian Engineering Standards Association, asking for representation on various sub-committees from this Association were read.

Moved by Mr. Buchanan and seconded by Mr. McHenry:

That Mr. P. E. Hart, Toronto Hydro-Electric System be appointed to represent this Association on the sub-committee of the Canadian Engineering Standards Association. Carried.

Referring to correspondence re the appointment of a representative of this Association on the Approval Committee of the Commission, it was moved by Mr. Buchanan and seconded by Mr. Martindale:

That the appointment of Mr. C. E. Schwenger as representative of this Association on the Approval Committee of the Commission be confirmed. Carried.

The letter from Mr. F. C. T. O'Hara, Deputy Minister, Department of Trade and Commerce, Ottawa, in reference to inspection of electric light and power meters, which was published in the September issue of the BULLETIN, was considered.

Moved by Mr. Couzens and seconded by Mr. Buchanan:

That the Secretary write Mr. O'Hara asking him for a financial statement covering the Meter Inspection Department. Carried.

Mr. Couzens then presented a report from the Papers Committee outlining a proposed programme for the next convention of the Association. It was as follows:

Paper on "Appliance Sales," by Mr. E. V. Buchanan, London; discussion to be opened by Mr. W. L. Goodwin.

Paper on "Grounding," by Mr. J. G. Jackson, Chatham; discussion to be opened by Mr. H. F. Strickland.

Speech at dinner by Major W. W. Pope.

The Secretary advised the meeting of a conversation he had had with Mr. P. B. Yates, who was unable to attend the meeting, in which he wished to have the following subjects brought up for general discussion at the next convention, viz.:

Rates for Electric Water Heaters, Service Charge for Electric Ranges, Electric Devices Above a Certain Capacity to be 3-wire by Law.

Mr. Yates promised to prepare a circular on these subjects to be distributed in advance of the meeting.

Moved by Mr. Couzens and seconded by Mr. Martindale:

That the report of the Papers Committee be adopted, reserving the first afternoon to general business and discussion. Carried.

Moved by Mr. McHenry and seconded by Mr. Shearer:

That the next convention of the Association be held on January 15th and 16th, 1920. Carried.

The Secretary was instructed to arrange with the University of Toronto for the use of a lecture room for the convention.

The Secretary was also instructed to write the Chairman of the Convention Committee suggesting that he obtain the services of Jules Brazil, entertainer, for the convention dinner; also that the Carls-Rite Hotel be asked to serve the dinner.

Referring to the resolution passed at the previous convention in reference to the standardization of plugs and receptacles for appliances, the Secretary was instructed to ask the Chairman of the Regulations and Standards Committee to bring in a report at the coming convention.

Mr. R. C. McCollum, Treasurer, submitted a report of the finances of the Association, showing a balance of cash on hand to date of \$442.93.

The meeting adjourned at 3.10 o'clock p.m.

Canada's Water Power Heritage

Excerpt from a paper—"Canada's Coal Demand"—Presented at the Twelfth Annual Convention of the Canadian Gas Association

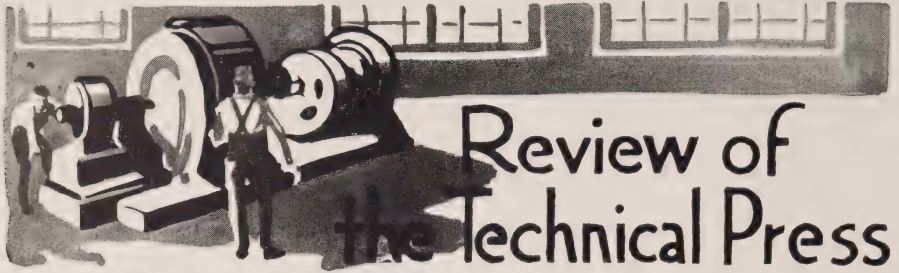
By Mr. Arthur V. White

Consulting Engineer, Commission of Conservation of Canada.

Canada, it is true, is richly endowed with water powers, but she can never depend upon this asset as a sole source of heat. We have about 19,000,000 estimated 24-hour low-water horse-power, of which less than 2,500,000 horse-power has been developed. By no means may all the water-powers be economically developed.

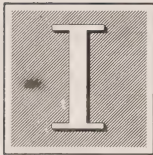
For many years past I have been emphasizing the comparatively limited use which can be made of electric

energy as a wholesale substitute for coal for heating—including the heating of buildings. There is no use whatever entertaining hope that hydro-electric energy as a heating agent may become an adequate substitute for coal for the citizens of Canada, and consequently a realization of this fact will facilitate the concentration of effort upon sources from which real relief may be derived.



Review of the Technical Press

Why Public Ownership got the Biggest Total of "Public Policy" Votes



IF the three public policy questions on last Tuesday's ballot Cook County voters gave public ownership the highest number of affirmative votes.

More voters picked out public ownership on the little ballot for either a "Yes" or "No" vote than was the case with any other proposition on the ballot.

The moral of this is that the people of Chicago did not need any urging to carry public ownership again by a decisive majority. Their education on public ownership lines was completed long ago. Now they simply vote for it every time they have a chance.

Chicago has not wavered in the belief of a majority of its citizens that public ownership will solve all the difficulties constantly arising with private ownership of leading utilities.

In fact, Chicago would have had public ownership of its surface traction lines long ago but for the State Supreme Court's technical ruling against the validity of Mueller certificates.

Under former Mayor Dunne, who was elected on a municipal ownership platform, the city sought and obtained from the Legislature the power to buy surface traction lines, and pay for them with these certificates.

The project was halted by the Supreme Court ruling that the city could not exceed its constitutional debt limitation, and that Mueller certificates would be a lien against the city rather than a lien exclusively against traction properties.

The people of Chicago postponed, but did not abandon, their plan to secure public ownership of traction lines. They gave the surface companies a new twenty-year ordinance in 1907, reserving a traction fund out of net profit for ultimate city ownership.

Now comes the setting aside of these 5-cent fare contracts by the State Utilities Commission, and the necessity of hard litigation in the courts to protect their validity.

But the heart of the whole issue is again touched by Mayor Thompson's announced programme of a "people's ownership" of traction lines that will do away forever with private ownership and contract repudiations.

There you have one reason why the people of this county rolled up the biggest majority last Tuesday for public ownership, as compared with all other propositions on the ballot.

And don't forget that the people have now instructed their delegates to the constitutional convention to write into the new organic law a simple method by which municipalities may acquire public utilities without exceeding the general debt limitations that the constitution prescribes.

In short, it is the people's wish, as their recorded votes show, that cities and towns may buy income-producing utilities, and pay for them out of

profits, by issuing bonds against these securities alone.

This stepping stone toward public ownership was just as popular in the down-State counties as in Chicago, proving once more that Illinois' cities and towns are determined to stand together in a battle for sane public ownership of utilities.

As for Chicago, the City Council's immediate duty is to give Mayor Thompson, as the Transportation Committee recommends, power to name a commission of experts to work out a "people's ownership" plan.—*Chicago Herald-Examiner*.

Canada may Lead World in Electric Power Production

CRYSTAL BEACH, Ont., Oct. 30.—Residents here were highly elated at the action of the 200 delegates at the Hydro Power Convention held yesterday in Toronto, when it passed a resolution favoring the retention of Sir Adam Beck as head of the Hydro-Electric Power Commission.

A committee composed of John H. Redsecock, M. J. McAlpine, G. L. Brodie, J. Nagel, Charles Sheppard and J. M. Sherk attended the convention from here.

Previous to election Sir Adam Beck issued a statement that if defeated in Parliament he would resign from the Hydro-Electric Power Commission. At the meeting yesterday three seats in Parliament were promised him.

In a brief address Sir Adam stated that since there was no government as yet formed in Ontario he would remain to help organize whatever government should come into power in the next year.

The convention delegates announced the extension of power in the Saint Lawrence Canal; also that the amount of power to be added when the new Chippawa Canal is completed would provide Canada within the next five years with a total of 2,000,000 horse-power. This, it is hoped, will be increased to 10,000,000 horse-power within ten years, making Canada the leading country in the world in the amount of hydro power.—*Buffalo News*.

Public Ownership Pays in Seattle



SEATTLE'S gigantic publicly - owned port business cleared a net profit, after depreciation and interest had been paid, totalling \$239,506.97 during the first nine months of the present year, according to the auditor's report filed with the port commission. The month of September the business returned a net profit of \$27,723.50, the report stated.

Although the total business transacted during the first nine months of the year shows a falling off when compared with the same period during 1918, the net revenue accruing is greater, the report stated. Due to the immense war shipments, 1918 was an abnormal year in the volume of business handled. The increased profits are due to greater efficiency in operation and more modern time and labor-saving devices.

The gross earnings of the port for the nine months period were \$1,387,543.26, while the expenditures, including interest and depreciation, were \$1,151,297.76, which, with an allowance of \$3,161.47, made for the adjustment of old balances and claims, leaves the sum of \$239,506.97, or better than a quarter of a million dollars in profits. The report indicates that the port commission business will return a net profit of \$300,000 for the year 1919.

Seattle's port facilities are among the largest in the world, and are equipped with every modern device to increase efficiency and earning power.

Plans for the extension of the present port facilities are being con-

sidered in proceedings arranging for the plotting of Lake Washington, which is connected with Puget Sound by canal. Large additional harbor facilities for the port of Seattle are available in fresh water if it becomes necessary to use them.—*Constitution, Atlanta, Ga.*



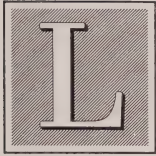
Not a Permanent Job

City Superintendent: "Well, Brown, you've been with us for fifty years now; I'm afraid you will have to take a pension and make way for a younger man."

Brown: "Well, if I'd known this wasn't going to be a steady job, I'd never have taken it in the first place."

Preventing Damage to Logs in Storage

Various Methods Recommended for Minimizing Loss Through Deterioration



LOGS stored on skidways or left in the woods during the summer months may be damaged in a number of ways, principally through sap-staining, insect attack, decay, and checking. Certain species of wood are more susceptible to injury than others, and the extent of the injury is also dependent upon the time of cutting, the climate, and the storage conditions. The possible financial loss and amount which can profitably be expended to prevent it will be influenced by the value of the logs, the purposes for which they are to be used, and the probable extent of the injury. Where conditions permit, one or more of the following methods may be found useful in minimizing the loss.

Storing under water will prevent "blue stain," checking, insect attack, and decay, except that logs in seawater, where marine borers are active, would be subject to attack by these pests. Wood of any species completely submerged in water will resist decay indefinitely. Alternate wetting and drying, however, favour decay.

Storing on skids in such a way that the air can circulate freely around each log will prevent the accumulation of moisture and thus retard decay. Such storing, however, is liable to in-

crease checking and, unless the bark is removed, will have little effect in preventing insect attack. The skids should be located where there is good air circulation, and they should be raised off the ground. Weeds and brush should be cut down.

Peeling the bark completely from the logs will do much to eliminate insect attack and retard decay, by removing the protection required by many insects, and by allowing the logs to dry more rapidly. It will favour checking, however.

Painting the ends of the logs with paints of the proper kind will very materially retard the loss of moisture and thus retard end checking. If the logs are peeled and properly piled on skids, painting should not increase the danger from decay or sap stain. A yellow ochre or barn paint will do fairly well for this purpose.

Painting the peeled surfaces with coal-tar creosote will be useful in preventing sap decay, and if applied soon enough may be effective in retarding sap stain. Any grade of creosote in common use for wood preservation is suitable, and expensive oils are unnecessary.

All the methods described, except water storage, may be employed at the same time, and to good advantage if circumstances justify the expense.—*U. S. Forest Service.*

Live with to-day—give to-day your best, the best of your heart, mind and body. Be kindly, be charitable, be ambitious, be honest, so that when to-day has passed and you look back,

there'll be nothing to regret. The future we cannot see, but to-day is here—live for to-day.—*Edw. W. Young.*



Photo by Popular Science Monthly

General View of the new Hydro Power Canal at Niagara Falls

A Record Fine for Violating the Commission's Regulations



HE heaviest fine which has been recorded to date for violating the Commission's wiring regulations was handed out by Magistrate

Craven, of Stayner, when a Toronto electrical contracting firm were fined \$450 and costs on two counts.

This firm went out of town, assuming probably that they could perform electrical work in some of the remote districts without permits and no one find it out. They removed a controller from a motor and replaced it with an open double-throw knife switch. It was only a matter of a few hours before the ever-watchful eye of the inspector fell upon the guilty parties, and they were promptly notified to take out a permit forthwith.

This notice was ignored, and was followed up with a defect notice requiring a proper compensator, or at least a safe, temporary expedient in the meantime. This notice was also ignored. The inspector, however, not wishing to exercise his authority without all due precaution and sufficient warning, even wrote the contractor a

third time. Having received no reply or attention to his notices, he was instructed to proceed against these people for first of all having failed to take out a permit, and, secondly, for failing to correct the defects when notified.

To make matters worse the defendants failed to appear in Police Court, and although the case was adjourned to give them a second opportunity, they again failed to respond to the orders of the court, with the result that they were fined \$50 on the first count and \$400 on the second, with costs.

This fine was given considerable prominence in the daily papers, and according to reports from the different inspection districts caused an abnormal demand for permits on work which had been started, or about to be started the next day.

It is evident from the foregoing that the magistrates and general public receiving the protection of the Commission's inspection system are behind the proper enforcement of such laws.

The Flaw

Lazy Lorenzo and Dog-Tired Dick were discussing something they knew little about—work.

"I think," said Lazy Lorenzo, "that if they did away with work altogether it'd put an end to these 'ere strikes."

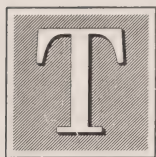
"Yus," said Dog-Tired Dick, "That'll be the time when everything's done by electricity. Only got to press a button and the job's done."

A slow horror dawned in Lazy Lorenzo's eyes.

"That won't do!" he said emphatically. "Who's a-goin' to press the button?"—*Tit-Bits*.

"Dere's lots o' nicer things to go onto yore tombstone dan 'Heah lies a cracker-jack crap-shooter.'" — *Texas Utility News*.

High Living Costs



HE high cost of living is the greatest material problem of our day.

For the man with a small income, it is a large-sized menace; even for the man with a comfortable income it is a source of continual worry.

The phenomenal rise in prices since 1914 is due to the scarcity of goods brought about by the suspension of production during the war. We have also wasted untold quantities of material for war purposes.

This shortage and this waste must be made good before the world can be again as prosperous as in 1914. Until they are made good, it is useless to expect that prices will materially decline, or even remain stationary.

Recognizing this fact, many people propose that we get over the difficulty by increasing wages, salaries and profits in the same ratio as the advance in prices. If this were possible, the effect would be the same as reducing prices to pre-war levels. Ultimately, this may take place, but certainly not soon.

The "day-light savers" realized that they could not get the public to perform every act of the day one hour earlier than usual, so they innocently deluded us by advancing the clock. It worked, because there was no fundamental law against it. But we cannot cheat ourselves over the cost of living in the same manner. Increasing wages without augmenting production sends up prices and leaves *real* wages unimproved.

What does the higher cost of living really mean? Sweeping aside the camouflage of prices expressed in currency, it means this: That we must now put forth greater effort and work harder to obtain the same satisfactions. There is no cure for it but economy and increased production.

It is not in the nature of the average human being to economize in what is lightly come by, nor to work any harder than is necessary to obtain a comfortable living.

Therefore, the high cost of living is not only natural, but necessary at the present time. Let us face this blunt truth bravely and apply ourselves patiently to work and *to save*—the only remedy.—*Conservation.*

Hydro Club Formed

The Toronto Hydro-Electric System have granted their employees for use as a club-house, the old residence formerly occupied by Justice MacLennan, at 30 Murray street, until such time as they are ready to put up a Hydro building.

The ten-roomed club-house is surrounded by tennis courts, lawn bowling greens, etc. There is a large bil-

liard room, a special ladies' room, two music and lounge rooms, a library and writing and four card rooms.

Out of the six hundred employees, three-quarters of the number have already become members. A Halloween "hard times masquerade" has been planned.—*Labor News, Hamilton, Ont.*



WHO'S WHO *in* HYDRO?



ALTER CHARLES McCALL, Secretary of the Public Utilities Commission, Simcoe, Ontario, was born in the Township of Char-

lotteville, in the County of Norfolk, on April 20, 1853. He came of Scotch ancestors, of U. E. Loyalist stock, his early forbears having settled in the County of Norfolk in 1796.

As Mr. McCall says: "From the age of six to sixteen I went to a country school two miles from my home, and then to the High School at Simcoe, intending to make a civil engineer of myself. I had some experience with Thomas W. Walsh, a Provincial Land Surveyor, and Frank Gordon, C.E., on the old Port Dover and Woodstock Railway, but for the good of the profession, possibly, I was taken down with rheumatism for over a year, and gave up the idea, became a clerk for my brother, now Senator McCall, in the lumber business, went to Duluth, Minnesota, in 1882, and engaged in the same business until 1884, when I volunteered as a 'voyageur' in the Nile expedition for the relief of General Gordon, at Khartoum, in Egypt, and am the proud possessor of two medals, one from the British, and the



W. C. McCall

'bronze star' of Egypt from that Government, carrying one bar for the Battle of Kerbekhan.

"I was appointed Clerk of the Town of Simcoe in February, 1896, which position I now hold, and Secretary of the Public Utilities Commission in 1917.

"I have one fad, that of coin and medal collecting, of which I have several thousand pieces; otherwise I am a very ordinary individual."





DOERR was born on a farm near Hawksville, in the township of Waterloo, in the Province of Ontario, on the twenty-fifth day of October, A.D 1882. During his early life he attended the Public School and worked on the farm until twenty-one years of age. When farming ceased to be his occupation the Bell Telephone Company of Canada gave him employment for seven years, and during one and one-half years of that period was foreman in area No. 103. After severing his connection with them the following seven years of his life were spent in the employ of the Toronto Electric Light Company, at the City of Toronto, the Hydro-Electric Power Commission of Ontario, Regina Electric Light Company of Regina, Sask., and chief inspector of the manufacture of 18-inch shells with the Steel and Radiation Limited, Toronto, Ont. In 1916 he was married. In the month of August, 1917, was



A. Doerr

engaged by the Hydro-Electric Power Commission of the town of Orangeville as superintendent of the Hydro-Electric System there, and still retains that position.

Safe Stairways



RECENTLY we have had an accident in which a stenographer fell from a landing in the stairs in our office to the first floor, a distance of about twelve steps. She could not explain just how she tripped, nor could we find a definite solution. Later another girl fell in the same place, and she likewise was unable to give a satisfactory explanation. Careful consideration was given to this problem, and the solution was finally found.

The step next to the top was two inches wider than the rest, so that a person descending from the landing, by looking at the top step, would get a false impression of the width of the tread for the entire flight. Naturally, the pace was gauged to the first step, and undoubtedly both of these girls fell when they overstepped the second tread. Would detailed inspection find a similar condition in your plant?—*Thos. Stanion, Manager, Safety and Sanitation, The Aluminum Castings Co., Cleveland, O.*

A Message from our President



FOR centuries the church has taught that the most important work in this world is the saving of souls, and, generally speaking, the world has acquiesced in that doctrine. The second most important work the world has to do, it seems to me, is the conserving of that priceless thing, the greatest asset we, our families and our country have, the lives and limbs of its men, women and children, so that we may have the benefit of their thought, their ingenuity and their labor to produce what we need to make us happy, contented, successful and prosperous. The National Safety Council was organized and is maintained for that purpose and that only. If the Council can interest the public in the supreme importance of putting a stop to the unnecessary loss of life and the crippling and maiming of our citizens, it will accomplish, next to Christianity, the greatest good to mankind.

When the Council was organized it devoted itself to the work of accident prevention in our industries, and because of the splendid service rendered its members and the inspiration it aroused, was so successful in reducing accidents to workmen that it became recognized as the one national organization that has accomplished the greatest results. Its membership, which was less than forty at the time of its inception, increased by leaps and bounds until it has now reached the astonishing number of 3,746, and is still growing.

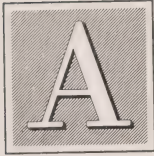
The Council has now decided to start an educational campaign for public safety, safety in the homes, and to have safety taught in the public and parochial schools, believing that by so doing it will bring to the attention of all our people the great and unnecessary loss of life in public places and in homes, and thereby impress upon them the necessity of applying the proper remedy—education and the making and enforcing of reasonable rules and laws.

It is hoped that every member of the Council will concentrate his efforts to this end and do his share to accomplish the desired result.

We should all remember that Safety First is not a question of dollars and cents; it is a question of saving human life, the most valuable thing in the world, which, when once gone, can never be brought back. It is trying to save men from losing their legs and their arms, which can never be put back. It is trying to save the making of widows and orphans, destitution and misery. Neither the officers of the industries nor the laws can do it. But the workmen can do it if they try. And if we will all work in harmony we will not only save life and limb, bring greater content and happiness to our people, but will increase our standing and influence, as well as our membership, a hundred-fold.

It is a man's job we have undertaken, but if we go at it enthusiastically, and every great movement in the annals of the world has been the triumph of enthusiasm, we will accomplish the result desired.—*Ralph C. Richards, in National Safety News.*

W. W. Freeman, New President of the Society for Electrical Development



At a meeting of the Board of Directors of the Society for Electrical Development, held at the Society's office, in the Engineering Societies Building, New York City, on November 11th, Mr. W. W. Freeman was unanimously elected President of the organization, succeeding Mr. Henry L. Doherty, who has held that office since the founding of the Society nearly six years ago.

As president of the Union Gas and Electric Company of Cincinnati, Mr. Freeman is well known to all branches of the electrical industry.

Being vice-chairman of the Public Policy Committee of the National Electric Light Association, of which committee Mr. Freeman was chairman for a number of years, the new president brings to the Society a broad experience in dealing with matters pertaining to the relations between the great electricity consuming public and the people who produce and market the energy and the devices through which it is used.

Under his leadership the Society will continue its excellent work of co-ordinating and assisting all branches of the electrical industry to bigger and better business, as well as carrying to the public the message, "Do It Electrically."

Under the guidance of Mr. Doherty, its past president, the Society has done a big work in getting the various branches of the electrical industry together and advancing their united interests. The extent of this work is made evident by a few extracts from the annual report of the So-

ciety's General Manager, Mr. James M. Wakeman.

This report emphasizes the fact that in spite of the handicap of the war the Society was able to continue its regular work of supplying articles on electrical subjects to newspapers, trade journals and popular magazines. A great deal of extremely valuable publicity for the electrical industry was thus obtained. Particular attention has been paid to developing the demand for household appliances, and motors for industrial purposes. The Society has under way a campaign for better industrial illumination.

When one realizes the effort that was previously required to sell washing machines, electrical ranges, vacuum cleaners, or even irons, it is possible to appreciate in some measure the tremendous effect of the educational work the Society has carried on during the past six years. The industry is reaping the benefit to-day, but as the effect is accumulative, still greater business is assured for the future.

The electric range hand-book prepared by the Society has been pronounced by range manufacturers, dealers and salesmen the greatest help ever supplied to them in their work of selling the "idea of cooking electrically."

The *Monthly Sales Service* has been regularly issued, and its general character not only maintained, but greatly improved. The electrical men in all sections of the country are continually expressing their appreciation of the great help the *Sales Service* is in carrying on their business.

Now that members have become familiar with the character of special services which they can receive from the Society, requests for this sort of help are coming in daily. These requests range all the way from information wanted on voltages of lighting circuits in foreign cities, heating and cooking rates in American cities, numerous uses of electricity in the various industries, down to the names and addresses of manufacturers of this or that electrical device, or the preparation of advertising copy and the outlining of a special sales campaign.

The staff of the Society has always co-operated with other electrical organization in every way possible. While there have been at times apparent duplications of the work of the Society, it is believed that with a better understanding of the work of this organization there will be a better spirit of co-operation.

It is not only interesting, but extremely significant how the Society has attracted the attention of other countries. Great Britain has started an "Electrical Development Association," patterned upon the Society for Electrical Development. They have studied the literature, the aims and achievements of the American society, and have decided to carry on the same kind of work over there to develop the industry in Great Britain. A member of that association has visited the Society's offices and spent several days going carefully over its files.

Other visitors have come from Switzerland, from France, and from Japan, all with the object of studying the methods of the Society, and with a view to inaugurating similar organizations in their own countries.

The Society is now conducting another of its national campaigns.

Through the drive for "An Electrical Christmas" the public is learning of the appropriateness of electrical devices as Christmas gifts. Reports from members and non-members alike indicate that the Society is again doing the right thing at the right time. In addition to the election of Mr. Freeman as president, two new vice-presidents were also unanimously elected. Mr. Fred Bissell, of the F. Bissell Company, of Toledo, is widely known as a progressive member of the electrical jobbers' fraternity. Mr. James R. Strong, of the Tucker Electrical Construction Company, of New York, stands high in the estimation of electrical contractors and dealers.

Mr. Charles L. Edgar, president of the Edison Electric Illuminating Company, of Boston, was appointed a director representing central station interests, in place of Mr. E. N. Sanderson, resigned.

Mr. Arthur J. Binz, of Houston, Texas, newly elected Jupiter of the Jovian Order, was appointed to the Board in place of Mr. L. O. Ripley.

Mr. J. E. Montague was elected chairman of the new Executive Committee, the other members being W. W. Freeman, L. P. Sawyer, W. D. Steele, E. W. Rockafellow, J. R. Strong, Fred B. Adam, and J. Robert Crouse.—*The Society for Electrical Development, Inc.*

Cause and Effect

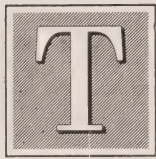
If you have a peppy Christmas window you may expect increased purchases.

W.P.B.



Sales Development

The November Washer Campaign



THE November campaign on electric washers succeeded beyond expectations in practically every town participating. The campaign was confined to the 60 cycle towns on account of the impossibility of obtaining 25 cycle machines, and even on the 60 cycle machines sales were retarded by slow deliveries. We reproduced one of the campaign advertisements in the October Bulletin, and the trial order post-card and circular letter used are shown herewith. These will interest Hydro shops where the campaign has not yet been run. The conclusions to be drawn from the success of this sale are that the electric washer is the best appreciated labor-saving appliance that can be introduced into the home, and that the time payment plan, as uniformly adopted by the Central Ontario towns is a splendid success. Consumers on your local System should undoubtedly have the benefit and convenience of installment payments. Where properly secured by a lien, no difficulty is experienced in making collections, and the accommodation increased sales enormously. In this connection you will recall the poster used in the recent Victory Loan Campaign showing a picture of John Bull, "He Is Our Best Customer and He Needs Credit." John Bull is un-

questionably the best credit risk in the world. The time payment plan will doubtless prove an accommodation to many good credit risks in your town. Local managers realize that they are selling Service rather than Watts. If you find the customer can economically install a more efficient lamp or appliance, you recommend it, even though it reduces your load. This policy builds up a good-will that repays amply. If the electric washer will relieve your customer of the barbarism of hand-washing, although it adds little to his current consumption, it is the greatest good-will builder of all, and will unquestionably make the sale of load-building appliances comparatively easy.

\$40,000,000 Worth

Forty Million Dollars worth of electric washers were sold in the United States last year, it is estimated.

A glance at washer ads in "Electrical Merchandising" will convince you that there will be a tremendous increase in 1920. Bill Goodwin says, "Build washing machine factories by the half-mile and you will never catch up with the demand."

The enormous amount of advertising is keeping the electrical industry constantly before the attention of the public. The Society for Electrical Development estimate that their

"Electrical Prosperity Week" and campaign, and "America's Electrical Week," resulted in the electrical industry securing approximately two and a half million dollars' worth of space, based on ordinary advertising rates.

The Commission's gigantic development at Chippawa, the Nipigon power development and the marvelous project for development on the St. Lawrence make us realize that we are living in an electrical age, and our province is the top of the world elec-

THE HYDRO SHOP

Dear Madam:

Here is an opportunity! The cheap power made available by Hydro in Ontario should make it possible for us to attain more nearly to the Universal use of labor saving appliances in the home than any other country in the world today.

If we are to have a high standard of civilization the wives and mothers of the land must be relieved of the old fashioned methods of labor.

Supersede the wash-board by an electrically operated washing machine, and you eliminate what is perhaps the most back ache heart breaking drudgery in the home today. The money you invest in such labor saving appliances will return you dividends in health and happiness.

The Hydro Shop is now offering you an exceptional opportunity to put a washing machine in your home. For a limited time we are offering you a complete electric motor driven washer at a price of \$80.00, as advertised. This offer is only made possible by the co-operative purchasing of the Hydro Shops throughout the Province. We are offering a special monthly installment payment plan which should bring this machine within the reach of every home. You have our assurance that this machine will wash clothes perfectly. By simply turning the switch you save hours of hard labour over the wash-board. . The motor driven wringer enables you to complete the operation with a minimum of labor.

Won't you step in and see this washer, ask questions about it, and let us explain it fully. If you cannot come in, sign and mail us the enclosed trial order post card and be convinced in your own home that washing is not an unpleasant task.

Yours very truly,

HYDRO-ELECTRIC POWER COMMISSION.

trically. The power development schemes of bewildering magnitude make it certain that the task of distributing approved, adequate efficient appliances for the utilization of electricity in the home is one of considerable importance. This is the function of the Hydro shop.

TRIAL ORDER

Gentlemen:— You may deliver to me one

which I agree to try, and if unsatisfactory to me, to return to you within 15 days from date. If I do not return it at that time, you may charge same to my account at (\$

which I will pay \$ down and balance in payments of \$ each with my monthly bills for current.

It is understood that if I return this within 15 days and is not satisfactory to me in every way, no charge will be made for its use.

Name

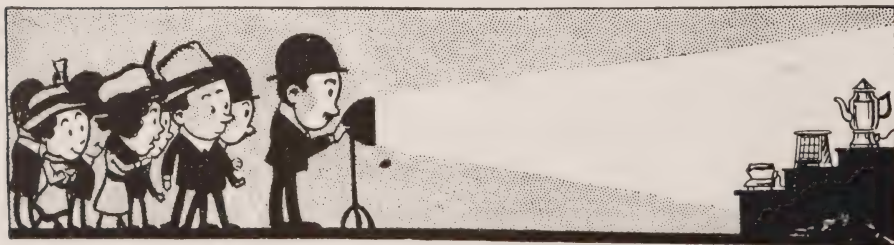
Taken by Address

An Electrical Christmas

The Society for Electrical Development is conducting a co-operative campaign under the slogan "An Electrical Christmas." To those towns who are members of the Society the November-December monthly Sales Service Bulletin of the Society offers almost every conceivable suggestion for the sales assistance of the contractor dealer or central station. If you are not a member of the society, "Electrical Merchandising" offers some valuable ideas.

The "Electrical News" is offering prizes for window dressing. Every Hydro shop on the system should

enter this campaign. The object of a competition of this kind is to induce every dealer to make their shop window effective. The number of contestants is a measure of the success of the contest rather than the skill displayed by a few of the more experienced. The cash prizes are small, but every contestant will be rewarded, as an attractive window arouses the kind of interest that leads to sales. Why not purchase a cake of "Bon-Ami," clean the windows and enter the contest? Use plenty of light and the usual material for decorating typical of the season.



As formerly money will be spent lavishly in useless and extravagant gifts, so that there is a real worth while economic motive in directing the attention of your customers to sane, useful and beautiful gifts electrical.

For Wife or Mother

Bottle Warmer	Percolator
Cleaner	Portable Sewing Machine
Coffee Urn	Range
Desk Lamp	Sauté Pan
Disc Stove	Sew Motor
Egg Boiler	Table Lamp
Flatiron	Teapot
Floor Lamp	Toaster
Grill Stove	Water Kettle
Home Wired	
Kitchen Motor	

For Husband or Father

Auto Horn	Illuminated
Auto Search Light	Shaving Mirror
Battery Lantern	Immersion water Heater
Cigar Lighter	Luminous Radiator
Drink Mixer	Portable Floor Lamp
Engine and Carburetor Heater	Shaving Mug
Flash Light Cane	Trouble Lamp for Auto
Flash Light Umbrella	Office Desk Lamp
Hand Lamp	
Heated Grips for Auto	

For Young Man

Alarm Clock	Pencil Flash Lights
Bed Lamp	Shaving Mirror (Illuminated)
Desk Lamp	Shaving Mug
Flash Light	
Fountain Pen	

For Young Woman

Bed Lamp	Hair Dryer
Boudoir Flatiron	Hair Singe
Boudoir Lamp	Massage Vibrator
Chafing Dish	Phonograph Motor
Comb and Curling Iron	Piano Lamp

For the Children

Bicycle Lamp	Engine
Boat	Flash Light
Candle Battery Lamp	Magic Lantern
Christmas Tree Lighting Outfit	Telegraph Set
Dark Room Lantern	Toy Automobile
Doll House (Electrically lighted)	Toy Construction
Electrical Toys	Toy Range
	Toy Railway Outfit
	Wireless Outfit

For Elderly Women

Foot Warmer	Teapot
Heating Pad	Table Clock (electrically lighted)
Medical Coil	Violet Ray Apparatus
Regulating Lamp or Socket	
Night Lamp	
Reading Lamp	

For Elderly Men

Bath Cabinet	Luminous Radiator
Ceiling Clock	Reading Lamp
Cigar Lighter	Shaving Mirror
Fan	Shaving Mug
Hearing Device	
Heating Blanket	
Immersion Water Heater	

For the Home

Air Heater	Fan
Alarms (Burglar and Fire)	Flatiron
Bread Mixer	Floor Polisher
Broiler	Food Chopper
Casserole	Washing Machine
Cereal Cooker	Food Warmer
Cleaner	Frying Griddle
Clocks	Grill
Coffee Mill	Home Telephones
Decorative Lamps	Illuminated Street Numbers
Disc Stove	Ironing Machine
Dish Washer	Incandescent Lamps
Door Bell	Kitchen Utility Motor
Dough Mixer	Knife Sharpener
Egg Beater	
Egg Cooker	

Hot Plate	Phonograph	Silver Polisher	tem
Liquid Mixer	Motor	Thermostatic	Waffle Iron
Luminous Radiator	Plate Warmer	Furnace Control	Water Heater
Modern Fixtures	Player Piano	Vegetable Slicer	Water Purifier
Oven	Range	Ventilating System	Water Supply System
	Refrigerator		

The Convention

At the coming Convention of the Association of Municipal Electrical Engineers in January, it is proposed to have a regular Goodwin meeting. This will be outside the regular programme of the convention. Members of the Electrical Jobbers, Manufacturers and Contractor Dealers' Associations and the Association of Municipal Electrical Engineers are all invited to attend.

The addresses given by Mr. Goodwin at the last two conventions certainly have created great interest, as evidenced by the animated discussions which took place from which much benefit has been derived. Those who

have previously heard Mr. Goodwin handle the subject of equitable merchandising in his inimitable style, will without doubt, be glad of an opportunity of hearing him again. Those who have not heard Mr. Goodwin should decide right now that this attraction alone will make the convention worth attending. It would undoubtedly be a great benefit if local managers in the larger cities can arrange to have those in charge of their Appliance Department, who have not already done so, hear Mr. Goodwin. If you have any unsolved problem in merchandising make a note of it and come to the convention without fail.



Showing H.R.H. The Prince of Wales, entering Ontario Power Company's Office



Hydro Municipalities

NIAGARA SYSTEM

25 Cycles	Pop.
Acton	1,570
Ailsa Craig	462
Ancaster	400
Ancaster Township	4,577
Aylmer	2,119
Ayr	780
Baden	710
Barton Township	6,061
Beachville	503
Biddulph Township	1,750
Blenheim	1,257
Bolton	727
Bothwell	695
Brampton	4,023
Brantford	26,601
Brantford Township	7,739
Breslau	500
Bridgen	400
Burford	700
Burford Township	3,882
Burgessville	300
Caledonia	1,236
Chatham	13,943
Chippewa	707
Clinton	1,981
Comber	800
Dashwood	350
Delaware	350
Dereham Township	3,176
Dorchester	400
Dorchester S. Tp.	1,457
Drayton	613
Dresden	1,403
Drumbo	400
Dublin	218
Dundas	4,834
Dunnville	3,286
Dutton	840
Elmira	2,065
Elora	1,005
Embro	472
Etobicoke Township	5,822
Exeter	1,504
Fergus	1,679
Flamborough E. Tp.	2,229
Forest	1,421
Galt	11,920
Georgetown	1,654
Goderich	4,553
Grantham Township	3,133
Granton	300
Guelph	16,022
Hagersville	1,053
Hamilton	104,491
Harriston	1,563
Hensall	717
Hespeler	2,887
Highgate	427
Ingersoll	5,300
Kitchener	19,380
Lambeth	350
Listowel	2,291
London	57,301
London Township	6,024
Louth Township	2,212
Lucan	643
Lynden	662
Markham	909
Merriton	1,670
Milton	1,947
Milverton	929
Mimico	2,004
Mitchell	1,656
Moorefield	335
Mount Brydges	500
New Hamburg	1,398
New Toronto	1,423
Niagara Falls	11,715
Niagara-on-the-Lake	1,318
Norwich	1,093
Norwich N. Township	2,029
Norwich S. Township	1,907
Oil Springs	537
Otterville	500
Palmerston	1,843
Paris	4,437
Petrolia	3,047
Plattsville	550
Point Edward	937

Port Credit	1,179
Port Dalhousie	1,318
Port Stanley	1,331
Preston	5,284
Princeton	600
Ridgetown	2,080
Rockwood	650
Rodney	626
Sandwich	3,077
Sarnia	12,323
Scarborough Township	5,525
Seaforth	2,075
Simcoe	4,032
Springfield	422
St. Catharines	17,917
St. George	600
St. Jacobs	400
St. Mary's	3,960
St. Thomas	17,216
Stamford Township	3,418
Stratford	17,371
Strathroy	2,816
Streetsville	500
Tavistock	974
Thamesford	504
Thamesville	742
Thorndale	250
Tilbury	1,605
Tillsonburg	3,059
Toronto	460,526
Toronto Township	5,008
Townsend Township	3,268
Vaughan Township	4,059
Walkerville	5,349
Wallaceburg	4,107
Waterdown	696
Waterford	1,027
Waterloo	5,091
Waterloo Township	6,538
Watford	1,115
Welland	7,905
West Lorne	708
Wellesley	583
Weston	2,283
Windsor	26,524
Woodbridge	615
Woodstock	10,004
Wyoming	526
Zurich	450

Total 1,061,250

SEVERN SYSTEM

60 Cycles	
Alliston	1,237
Barrie	6,861
Beeton	588
Bradford	946
Camp Borden
Coldwater	617
Collingwood	7,010
Cookstown	635
Creemore	599
Elmvale	775
Midland	7,109
Orillia	7,448
Penetang	3,672
Port McNichol	500
Stayner	990
Thornton	250
Tottenham	557
Victoria Harbor	1,542
Waubashene	600

Total 41,941

WASDELL'S SYSTEM

60 Cycles	
Beaverton	821
Brechin	215
Cannington	746
Sunderland	570
Woodville	357

Total 2,709

NIPISSING SYSTEM

60 Cycles	
Callander	650
Nipissing	400
North Bay	9,651
Powassan	572

Total 11,273

MUSKOKA SYSTEM

60 Cycles	Pop.
Gravenhurst	1,600
Huntsville	2,135

Total 3,735

EUGENIA SYSTEM

60 Cycles	
Alton	700
Artemesia Township	2,396
Arthur	1,003
Chatsworth	286
Chesley	1,860
Dundalk	750
Durham	1,520
Elmwood	500
Flesherton	428
Grand Valley	586
Hanover	3,310
Holstein	285
Horning's Mills	350
Kytsyth
Markdale	904
Mount Forest	1,871
Neustadt	470
Orangeville	2,381
Owen Sound	11,819
Shelburne	1,018
Tara	620

Total 33,057

OTTAWA SYSTEM

60 Cycles	
Ottawa	100,561

THUNDER BAY SYSTEM

60 Cycles	
Port Arthur	15,224

CENTRAL ONTARIO SYSTEM

60 Cycles	
Belleville	12,080
Bloomfield	523
Bowmanville	3,545
Brighton	1,278
Cobourg	4,457
Colborne	811
Deseronto	2,061
Kingston	22,265
Lindsay	7,752
Madoc	1,114
Millbrook	746
Napanee	2,881
Newburgh	444
Newcastle	600
Omeme	446
Orono	700
Oshawa	8,812
Peterboro	28,996
Pictou	3,408
Port Hope	4,486
Stirling	823
Trenton	5,169
Tweed	1,350
Wellington	829
Whitby	2,902

Total 118,478

ST. LAWRENCE SYSTEM

60 Cycles	
Brockville	9,473
Chesterville	868
Prescott	2,630
Williamsburg	100
Winchester	1,042

Total 14,113

RIDEAU SYSTEM

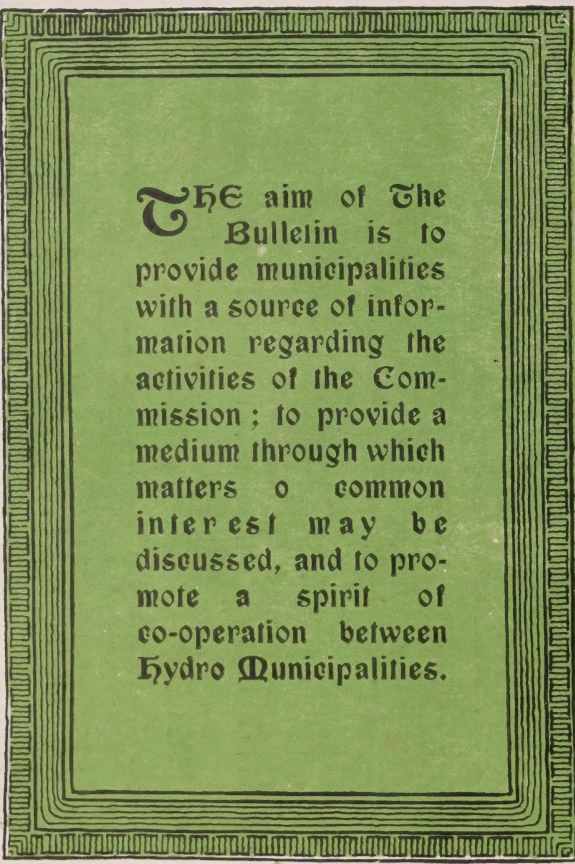
60 Cycles	
Carlton Place	3,706
Perth	3,358
Smith's Falls	6,115

Total 13,179

ESSEX COUNTY SYSTEM

25 Cycles	
Amherstburg	1,990
Canard River	50
Cottam	100
Essex	1,429
Harrow	375
Kingsville	1,633
Leamington	3,604

Total 9,181



THE aim of The
Bulletin is to
provide municipalities
with a source of infor-
mation regarding the
activities of the Com-
mission ; to provide a
medium through which
matters of common
interest may be
discussed, and to pro-
mote a spirit of
co-operation between
Hydro Municipalities.